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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: YUDA et al.

Serial No.: 09/820,149

Filed: March 28, 2001

For: REMOTE PLASMA APPARATUS FOR PROCESSING ...

Group: 1763

Examiner: ANNA M. CROWELL

DOCKET: NEC WNZ-2310

Assistant Commissioner of Patents & Trademarks
Washington, D.C. 20231AMENDMENT B UNDER RULE 116

Dear Sir:

This Amendment is being filed in response to the Final Action mailed February 6, 2003.

The Examiner's continued rejection of claims 1, 2, 4, 5, 7, 8, 10, 11, 13, 14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 29, 31, 32, 34, 35, 37, 38, 40, 41, 43, 44 and 46 under 35 USC § 112, is in error. Applicants' specification provides specific working examples of what is meant by "aperture ratio" (see the paragraph bridging pages 7-8; the paragraph bridging pages 8-9; the last full paragraph on page 9; and the last full paragraph on page 12 of the specification). Thus, according to the description on page 7, line 23, a plate has a size of 400mm x 500mm and therefore plane area of 200,000mm². The plate has 100 perforated holes each having a diameter of 11mm. The total area of the 100 perforated holes readily can be calculated using middle school arithmetic: area of a circle is determined by multiplying π by the square of the radius of the circle, i.e., $A = \pi r^2 = 3.14 \times 5.5^2 \times 100 = 9498.5\text{mm}^2$. Thus, the aperture ratio in question is given by $9498.5/200,000$ and is equal to 0.0474925. Therefore, the aperture ratio in the illustrated example is smaller than 5%! The present inventors have found that an aperture ratio

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Serial No. 09/820,149
Docket No. NEC WNZ-2310
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not greater than 5% is effective to suppress the flow of silane gas back into a plasma generation region 12 (see page 8, lines 10 to 12 of the instant specification).

Even assuming the Examiner's suggestion of a plate with only two layer diameter holes, while such structure may not provide commercially acceptable deposition uniformity, such construction would achieve the desired suppression of flow back since significant flow back would be prevented from the plate itself! Thus, the number of holes per se will not inhibit the functionality of the device as claimed in claim 1, provided the prescribed aperture ratio is followed. Furthermore, the prevention of flow back is not a claimed property of the apparatus, and regardless of whether there are two holes or one hundred holes, the apparatus of claim 1 would still be operable. Thus, the Examiner's erroneous contention that the flow back phenomenon would not be achieved with two holes also is irrelevant since that functional characteristic is not claimed in claim 1.

Moreover, the Examiner's suggestion to define the hole size in terms of diameter is inappropriate. As noted at the bottom of page 7 of Applicants' specification, "The perforated holes 41 may have other shapes." A "diameter" measurement is only appropriate for a round, i.e., circular shape. Modern cutting technologies, for example, laser cutting technologies, permit cutting of various shape holes. Quite apart from the foregoing, the Examiner is reminded that it is hornbook patent law that Applicants are entitled to be their own lexographer.

Turning to the rejection of claims 1, 2, 4, 11, 13, 14, 16, 23, 25, 26, 28, 35, 37, 38 and 40 under 35 USC § 102 as anticipated by Japanese Patent Publication 11-168094 by Yuda, as discussed in Amendment A, incorporated herein by reference, Yuda does not anticipate Applicants' claimed invention since Yuda discloses neither a flow back phenomenon of silane gas into a plasma generation region nor prevention of such a flow back phenomenon.

Serial No. 09/820,149
Docket No. NEC WNZ-2310
Amendment B under Rule 116

Accordingly, no consideration is made at all in Yuda about an aperture ratio mentioned above. Yuda merely teaches the injection of an inert gas and SiH_4 into a middle mesh plate electrode (paragraph 43, Figures 8 and 10).

All of Applicants' independent claims 1, 2, 11, 14, 23, 26, 35 and 38 require, respectively, a first inlet communicating with the plasma generation region to introduce a first gas into the plasma generation region, and a second inlet communicating with the processing region to supply a second gas into the processing region. Yuda does not teach this. Rather, Yuda combines and introduces his two gases directly in a processing region. Thus, Yuda cannot be said to anticipate any of the independent claims, 1, 2, 11, 14, 23, 26, 35 or 38 of Applicants' claims, or the several claims 4, 13, 16, 25, 28, 37 and 40 dependent thereon.

Turning to the rejection of claims 5, 7, 8, 10, 17, 19, 20, 22, 29, 31, 32, 34, 41, 43 and 44, and 46 as obvious from Yuda in view of Sameshima et al., each of said claims, directly or through dependency, like the claims above discussed, require a first inlet communicating with the plasma generation region to introduce a first gas into the plasma generation region, and a second inlet communicating with the processing region to supply a second gas into the processing region. As noted supra, Yuda does not teach this. The secondary reference, Sameshima et al., does not supply this missing teaching. Sameshima et al. teaches a CVD apparatus with a plurality of gas inlets to a mesh plate (col. 4, lines 25-43 and Figure 1). However, Sameshima et al. also fails to teach or suggest an aperture ratio of a disk shaped mesh plate. Thus, Sameshima et al., like Yuda, also fails to teach separate gas inlets communicating, respectively, with the plasma generation region and the processing region as required by Applicants' claims. Thus, no combination of Yuda and Sameshima et al. reasonably could

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achieve any of independent claims 5, 8, 17, 20, 29, 32, 41 and 43, or any of the claims 7, 10, 19, 22, 31, 34 and 46 dependent therefrom.

Finally, the Examiner's contention, on page 6 of the Action, that since the same problem, i.e., preventing the flow back phenomenon, is solved by both the Yuda et al. Patent and the instant invention, the aperture ratio of Yuda must be less than 5%, demonstrates that the extent to which the Examiner is using Applicants' disclosure to form her obviousness rejection! Such hindsight reconstruction of the prior art is clearly in error. See MPEP § 2143:

"[t]he teaching or suggestion to make the claim combination and the reasonable expectation of success must be found in the prior art not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ 2d 1438 (Fed. Cir. 1991)."

Since the Examiner relies on Applicants' disclosure to supply a teaching missing in Yuda, the art rejections are in error!

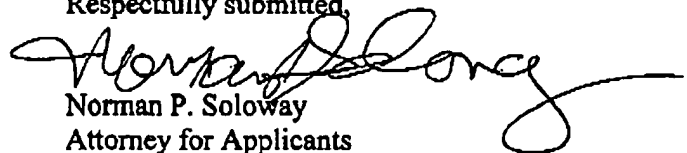
Having dealt with all the objections raised by the Examiner, the Application is believed to be in order for allowance.

A Notice of Appeal accompanies this Amendment.

Form PTO-2038 authorizing a charge in the amount of \$320.00 to cover the Appeal fee accompanies this Amendment.

In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our Deposit Account Number 08-1391.

Respectfully submitted,



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Docket No. NEC WNZ-2310
Amendment B under Rule 116

CERTIFICATE OF TRANSMISSION VIA FACSIMILE

I hereby certify that this correspondence is being sent via facsimile to EXAMINER ANNA M. CROWELL of the United States Patent and Trademark Office at facsimile number (703) 872-9311 on April 18, 2003 from Tucson, Arizona.

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